WEST Search History

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DATE: Wednesday, March 03, 2004

Hide?	Set Name	Query	Hit Count
		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=AND	
☐	L1	(PASTEURELL$ OR HAEMOLYT$ OR HEMOLYTICA$).ti,ab,clm.	1897
☐	L2	(pasteurell$ or haemolyt$ or hemolytica$).ti,ab,clm.	1897
☐	L3	L2 same (mutant or mutation or mutagenesis or modified or substitution or insertion or deletion or homolog or analog or deleted or delete or insert or modification or aro or aro$1 or aro-a).ti,ab,clm.	122
☐	L4	l3 and (aro or aroa or aro-a or aromatic$)	18

END OF SEARCH HISTORY

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End of Result Set

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L4: Entry 18 of 18 File: DWPI Oct 16, 2002

DERWENT-ACC-NO: 1995-224327
DERWENT-WEEK: 200279

TITLE: Prodn. of attenuated aroA mutants of Pasteurella haemolytica by DNA methylation - useful in vaccines for protection of cattle against P. haemolytica infection

INVENTOR: BRIGGS, R E; TATUM, F M ; BRIGSS, R E

PRIORITY-DATA: 1993US-0162392 (December 6, 1993), 1996US-0643300 (May 8, 1996), 1996US-0643297 (May 8, 1996), 1996US-0643298 (May 8, 1996), 1996US-0643301 (May 8, 1996), 1996US-0643299 (May 8, 1996)

Search Selected Search ALL Clear

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
ES 2173170 T3	October 16, 2002		000	C12N015/74
WO 9516045 A1	June 15, 1995	E	051	C12N015/74
AU 9513031 A	June 27, 1995		000	C12N015/74
EP 733114 A1	September 25, 1996	E	000	C12N015/74
US 5587305 A	December 24, 1996		022	C12N015/09
US 5683900 A	November 4, 1997		022	C12N009/16
US 5693777 A	December 2, 1997		021	C07H021/04
US 5733780 A	March 31, 1998		022	C12N015/74
AU 692817 B	June 18, 1998		000	C12N015/74
US 5824525 A	October 20, 1998		000	C12N001/21
US 5849305 A	December 15, 1998		000	A01J021/00
EP 1149587 A2	October 31, 2001	E	000	A61K039/102
EP 733114 B1	February 27, 2002	E	000	C12N015/74
DE 69430005 E	April 4, 2002		000	C12N015/74

INT-CL (IPC): A01 J 21/00; A01 J 25/12; A21 C 3/00; A21 C 11/00; A61 K 39/102; C07 H 21/04; C12 N 1/21; C12 N 9/10; C12 N 9/16; C12 N 9/22; C12 N 15/00; C12 N 15/09; C12 N 15/54; C12 N 15/55; C12 N 15/63; C12 N 15/74

ABSTRACTED-PUB-NO: EP 733114B

BASIC-ABSTRACT:

A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region.

USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection.

ABSTRACTED-PUB-NO:

US 5587305A
EQUIVALENT-ABSTRACTS:

A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region.

USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection.

A new method for producing a mutation in a particular region of DNA of a P. haemolytica genome comprises:

(a) isolating the region of the genome from P. haemolytica;

(b) introducing a mutation into the region to form a mutated DNA region;

(c) methylating said mutated DNA region with a methylating enzyme which inhibits endonuclease cleavage at a recognition sequence selected from the group consisting of 5'-GATGC-3' and 5'-GCATC-3', to form methylated DNA;

introducing said methylated DNA into a P. haemolytica cell to form transformants; and

screening said transformants for those which have said mutation in said region on chromosomal DNA of said P. haemolytica cell.

US 5683900A

A preparation of PhaI methyltransferase free from PhaI restriction endonuclease and a preparation of PhaI endonuclease free from PhaI methyltransferase are new.

US 5693777A

A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region.

USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection.

US 5733780A

A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region.

USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection.

US 5824525A

A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region.

USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection.

US 5849305A

A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region.

USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection.

WO 9516045A

ABSTRACTED-PUB-NO: EP 733114B
EQUIVALENT-ABSTRACTS: A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region. USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection. US 5587305A A new method for producing a mutation in a particular region of DNA of a P. haemolytica genome comprises: (a) isolating the region of the genome from P. haemolytica; (b) introducing a mutation into the region to form a mutated DNA region; (c) methylating said mutated DNA region with a methylating enzyme which

inhibits endonuclease cleavage at a recognition sequence selected from the group consisting of 5'-GATGC-3' and 5'-GCATC-3', to form methylated DNA; introducing said methylated DNA into a P. haemolytica cell to form transformants; and screening said transformants for those which have said mutation in said region on chromosomal DNA of said P. haemolytica cell. US 5683900A A preparation of PhaI methyltransferase free from PhaI restriction endonuclease and a preparation of PhaI endonuclease free from PhaI methyltransferase are new. US 5693777A A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region. USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection. US 5733780A A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region. USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection. US 5824525A A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region. USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection. US 5849305A A method for producing a mutation in a partic. region of DNA of the Pasteurella haemolytica genome comprises: comprises: (a) isolating the genomic region; (b) introducing a mutation in the region; (c) methylating the mutated region to prevent endonuclease cleavage at the sites 5'-GATGC-3' or 5'-GCATC-3'; (d) introducing the methylated DNA into P. haemolytica, and (e) screening the transformants for those with the mutation in the region. USE - The mutation using methyltransferase allows the construction of defined, attenuated aroA mutants for use as vaccines to protect cattle against P. haemolytica infection. WO 9516045A

CHOSEN-DRAWING: Dwg.0/6 Dwg.0/6 Dwg.0/6D Dwg.0/6 Dwg.0/6

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L4: Entry 1 of 18 File: PGPB Feb 19, 2004

PGPUB-DOCUMENT-NUMBER: 20040033586
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040033586 A1

TITLE: Attenuated gram negative bacteria

PUBLICATION-DATE: February 19, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Crooke, Helen Rachel	Winnersh Triangle		GB	
Shea, Jacqueline Elizabeth	Winnersh Triangle		GB	
Feldman, Robert Graham	Winnersh Triangle		GB	
Goutebroze, Sylvain Gabriel	Lyon		FR	
Le Gros, Francois-Xavier	Saint Genis Laval		FR	

APPL-NO: 10/ 406686 [PALM]
DATE FILED: April 3, 2003

RELATED-US-APPL-DATA:
Application is a non-provisional-of-provisional application 60/370282, filed April 5, 2002,

INT-CL: [07] C12 N 1/20

US-CL-PUBLISHED: 435/252.3
US-CL-CURRENT: 435/252.3

ABSTRACT:

Disclosed and claimed are a mutant of a gram negative bacterium, wherein said bacterium has at least one mutation in a nucleotide sequence which codes for a polypeptide having an identity which is equal or more than 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, or 99% with an amino acid sequence coded by a nucleotide sequence selected from the group consisting of nucleotide sequences identified SEQ ID NO: 2, 6, 9, 12, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 75, 78, 81, 84, 87, 90, 93; said mutation resulting in attenuated virulence of the bacterium. Immunogenic compositions and vaccines containing such a mutant are also disclosed and claimed.

RELATED APPLICATIONS/INCORPORATION BY REFERENCE

[0001] This application claims priority from U.S. provisional application Serial No. 60/370,282, filed on Apr. 5, 2002, incorporated herein by reference. The foregoing application, and all documents cited therein or during its prosecution ("appln cited documents") and all documents cited or referenced in the appln cited documents, and all documents cited or referenced herein ("herein cited documents"), and all documents cited or referenced in herein cited documents, together with any

manufacturer's instructions, descriptions, product specifications, and product sheets for any products mentioned herein or in any document incorporated by reference herein, are hereby incorporated herein by reference, and may be employed in the practice of the invention.

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L4: Entry 15 of 18 File: USPT Dec 24, 1996

US-PAT-NO: 5587305
DOCUMENT-IDENTIFIER: US 5587305 A

TITLE: Pasteurella haemolytica transformants

DATE-ISSUED: December 24, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

US-CL-CURRENT: 435/477; 424/93.2, 435/252.1, 435/252.3

CLAIMS:

We claim:

1. A method for producing a mutation in a particular region of DNA of a P. haemolytica genome comprising the steps of:

isolating said region of the genome from P. haemolytica;

introducing a mutation into said region to form a mutated DNA region;

methylating said mutated DNA region with a methylating enzyme which inhibits endonuclease cleavage at a recognition sequence selected from the group consisting of 5'-GATGC-3' and 5'-GCATC-3', to form methylated DNA;

introducing said methylated DNA into a P. haemolytica cell to form transformants; and

screening said transformants for those which have said mutation in said region on chromosomal DNA of said P. haemolytica cell.

2. The method of claim 1 wherein said step of methylating is performed by passage of said DNA region through a methylating cell containing PhaI methylase.

3. The method of claim 1 wherein said step of methylating is performed by passage of said DNA region through a methylating cell containing SfaNI methylase.

4. The method of claim 1 wherein the step of methylating is performed in vitro.

5. The method of claim 1 wherein the methylating enzyme is PhaI methylase.

6. The method of claim 1 wherein the methylating enzyme is SfaNI methylase.

7. The method of claim 2 wherein said methylating cell is a P. haemolytica strain which contains no PhaI restriction endonuclease activity.

8. The method of claim 2 wherein said methylating cell is a bacterium other than P. haemolytica which contains a gene encoding PhaI methylase.

9. The method of claim 2 wherein said methylating cell is a bacterium other than Streptococcus faecalis which contains a gene encoding SfaNI methylase.

10. The method of claim 1 wherein said methylated DNA is introduced into P. haemolytica on a plasmid containing a P. haemolytica 4.2 kb Str.sup.R plasmid deposited at the ATCC as Accession No. ATCC 69499.

11. The method of claim 10 further comprising:

screening said transformants for loss of said 4.2 kb Str.sup.R plasmid.

12. P. haemolytica strain NADC-D60aroA.sup.-, deposited at the ATCC as Accession No. ATCC 55518.

13. A P. haemolytica strain which harbors a mutation which abolishes expression of PhaI restriction endonuclease.

14. A P. haemolytica transformant made by the process of claim 1.

15. The transformant of claim 14 wherein the mutation introduced is an insertion.

16. The transform ant of claim 14 wherein the mutation introduced is a deletion.

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L4: Entry 11 of 18 File: USPT Oct 20, 1998

US-PAT-NO: 5824525
DOCUMENT-IDENTIFIER: US 5824525 A
**** See image for Certificate of Correction ****

TITLE: Construction of Pasteurella haemolytica vaccines

DATE-ISSUED: October 20, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

US-CL-CURRENT: 435/6; 435/252.1, 435/252.3, 435/441, 435/476

CLAIMS:

We claim:

1. A method for producing a mutation in a particular region of DNA of a P. haemolytica genome comprising the step of:

isolating said region of the genome from P. haemolytica;

introducing a mutation into said region to form a mutated DNA region;

introducing said mutated, DNA region into a P. haemolytica cell which does not express a PhaI restriction endonuclease, to form transformants; and

screening said transformants for those which have said mutation in said region on chromosomal DNA of said P. haemolytica cell.

2. The method of claim 1 wherein said P. haemolytica cell which does not express a PhaI restriction endonuclease is a natural isolate.

3. The method of claim 1 wherein said P. haemolytica cell which does not express a PhaI restriction endonuclease is a mutant made by chemical mutagenesis.

4. The method of claim 1 wherein said P. haemolytica cell which does not express a PhaI restriction endonuclease is a mutant made by a process comprising:

isolating a region of a genome from P. haemolytica;

introducing a mutation into said region to form a mutated DNA region;

methylating said mutated DNA region with a methylating enzyme which inhibits endonuclease cleavage at a recognition sequence selected from the group consisting of 5'-GATGC-3' and 5'-GCATC-3', to form methylated DNA;

introducing said methylated DNA into a P. haemolvtica cell to form transformants; and

screening said transformants for those which have said mutation in said region on chromosomal DNA of said P. haemolvtica cell.

5. A P. haemolytica mutant made by the process of claim 1.

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L4: Entry 9 of 18 File: USPT Dec 15, 1998

US-PAT-NO: 5849305
DOCUMENT-IDENTIFIER: US 5849305 A

TITLE: Construction of Pasteurella haemolytica vaccines

DATE-ISSUED: December 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Briggs; Robert E.	Boone	IA		
Tatum; Fred M.	Ames	IA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
The United States of America as represented by the Secretary of the Department of Agriculture	Washington	DC			06
Biotechnology Research and Development Corporation	Peoria	IL			02

APPL-NO: 08/ 643299 [PALM]
DATE FILED: May 8, 1996

PARENT-CASE:
This application is a division of application Ser. No. 08/162,392, filed Dec. 6, 1993 now U.S. Pat. No. 5,587,305.

INT-CL: [06] A01 J 21/00, A01 J 25/12, A21 C 3/00, A21 C 11/00

US-CL-ISSUED: 424/255.1; 424/93.2, 424/184.1
US-CL-CURRENT: 424/255.1; 424/184.1, 424/93.2

FIELD-OF-SEARCH: 424/255.1, 424/93.2, 424/184.1

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4293545	October 1981	Kucera	435/255.1
☐	4335106	June 1982	Kucera	424/255.1

☐	4346074	August 1982	Gilmour et al.	424/203.1
☐	4388299	June 1983	Kucera	424/255.1
☐	4506017	March 1985	Kucera	435/252.1
☐	4559306	December 1985	Kucera	435/252.1
☐	4626430	December 1986	Kucera	424/255.1
☐	4735801	April 1988	Stocker et al.	424/235.1
☐	4837151	June 1989	Stocker et al.	435/200.1
☐	4888170	December 1989	Curtiss	424/200.1
☐	4957739	September 1990	Berget et al.	424/190.1
☐	4999191	March 1991	Glisson et al.	424/255.1
☐	5055400	October 1991	Lo et al.	435/69.1
☐	5077044	December 1991	Stocker et al.	424/235.1
☐	5165924	November 1992	Shewen et al.	424/236.1
☐	5210035	May 1993	Stocker	435/235.1
☐	5238823	August 1993	Potter et al.	435/69.52
☐	5273889	December 1993	Potter et al.	435/69.51
☐	5389368	February 1995	Curtiss, III	424/93.2
☐	5424065	June 1995	Curtiss, III	424/93.2
☐	5468485	November 1995	Curtiss, III	424/184.1
☐	5476657	December 1995	Potter	424/184.1
☐	5543312	August 1996	Mellors et al.	435/220

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haemolytica," Am. J. Vet. Res. 47(6):1204-1206 (1986).
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ART-UNIT: 161

PRIMARY-EXAMINER: Housel; James C.

ASSISTANT-EXAMINER: Portner; Ginny Allen

ATTY-AGENT-FIRM: Banner & Witcoff, Ltd.

ABSTRACT:

Methylation of DNA can be a critical step in the introduction of DNA into P. haemolytica. A methyltransferase has been isolated and molecularly cloned for this purpose. Use of the methyltransferase has allowed construction of defined, attenuated mutants for use as vaccines to protect cattle.

4 Claims, 7 Drawing figures

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Search Results - Record(s) 1 through 18 of 18 returned.

☐ 1. 20040033586. 03 Apr 03. 19 Feb 04. Attenuated gram negative bacteria. Crooke, Helen Rachel, et al. 435/252.3; C12N001/20.

☐ 2. 6573093. 19 Oct 01; 03 Jun 03. Temperature sensitive plasmids of P. haemolytica. Briggs; Robert E., et al. 435/320.1; 424/255.1 435/471 536/23.7. C12N015/00.

☐ 3. RE38028. 21 Nov 00; 11 Mar 03. Molecular genetic construction of vaccine strains of pasteurellaceae. Briggs; Robert E., et al. 435/476; 435/243 435/252.1 435/252.3 435/320.1 435/440 435/471 435/477 435/69.1 536/23.1. C12N001/00 C12N001/21 C12N015/00 C12Q001/68.

☐ 4. 6495145. 19 Oct 01; 17 Dec 02. LktA deletion mutant of P. haemolytica. Briggs; Robert E., et al. 424/255.1; 424/234.1 424/93.4 426/2 426/89 435/455 435/69.1. A61K039/102.

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☐ 7. 6331303. 25 Sep 98; 18 Dec 01. LKTA deletion mutant of P. haemolytica. Briggs; Robert E., et al. 424/255.1; 424/234.1 435/252.3 435/471 435/69.1. A61K039/102.

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L3: Entry 1 of 122 File: PGPB Feb 19, 2004

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TITLE: Attenuated gram negative bacteria

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INVENTOR-INFORMATION:

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RELATED-US-APPL-DATA:
Application is a non-provisional-of-provisional application 60/370282, filed April 5, 2002,

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ABSTRACT:

Disclosed and claimed are a mutant of a gram negative bacterium, wherein said bacterium has at least one mutation in a nucleotide sequence which codes for a polypeptide having an identity which is equal or more than 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, or 99% with an amino acid sequence coded by a nucleotide sequence selected from the group consisting of nucleotide sequences identified SEQ ID NO: 2, 6, 9, 12, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 75, 78, 81, 84, 87, 90, 93; said mutation resulting in attenuated virulence of the bacterium. Immunogenic compositions and vaccines containing such a mutant are also disclosed and claimed.

RELATED APPLICATIONS/INCORPORATION BY REFERENCE

[0001] This application claims priority from U.S. provisional application Serial No. 60/370,282, filed on Apr. 5, 2002, incorporated herein by reference. The foregoing application, and all documents cited therein or during its prosecution ("appln cited documents") and all documents cited or referenced in the appln cited documents, and all documents cited or referenced herein ("herein cited documents"), and all documents cited or referenced in herein cited documents, together with any

manufacturer's instructions, descriptions, product specifications, and product sheets for any products mentioned herein or in any document incorporated by reference herein, are hereby incorporated herein by reference, and may be employed in the practice of the invention.

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Search Results - Record(s) 1 through 50 of 122 returned.

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☐ 27. 5693777. 08 May 96; 02 Dec 97. DNA encoding pasteurella haemolytica PhaI restriction endonuclease and methyltransterase. Briggs; Robert E., et al. 536/23.2; 435/196 536/23.7. C07H021/04 C12N009/16.

☐ 28. 5683900. 08 May 96; 04 Nov 97. Pasteurella haemolytica PhaI restriction endonuclcape and methyltranstesase. Briggs; Robert E., et al. 435/196; 530/300 530/350. C12N009/16.

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☐ 30. 5246845. 27 Oct 92; 21 Sep 93. Heterospecific modification as a means to clone restriction genes. Wilson; Geoffrey G., et al. 435/6; 435/193 435/199 435/252.33 435/320.1 435/478 536/23.2. C12N015/55 C12N009/22.

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L4: Entry 5 of 18 File: USPT Jun 25, 2002

DOCUMENT-IDENTIFIER: US 6410021 B1
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TITLE: Vaccines of pasteurellaceae mutants and vaccination method

Abstract Text (1):
A live vaccine of recombinant mutants of a member of the family Pasteurellaceae lacking a rib gene necessary for production of riboflavin as well as a method of vaccination therewith is described. The vaccine is effective against members of the family Pasteurellaceae.

Brief Summary Text (6):
A variety of mutations in biosynthetic pathways are known to be attenuating in other organisms. Lesions in aro(Hoiseth S. K. and B. A. D. Stocker. 1981. Aromatic-dependent Salmonella typhimurium are non-virulent and effective as live vaccines. Nature (london). 291: 238-239) (Homchampa, P., R. A. Strugnell and B. Adler. 1992. Molecular analysis of the aroA gene of Pasteurella multocida and vaccine potential of a constructed aroA mutant. Mol. Microbiol. 6: 3585-3593) (Homchampa, P., R. A. Strugnell and B. Adler. 1994. Construction and vaccine potential of an aroA mutant of Pasteurella haemolytica. Vet. Microbiol. 42:35-44) (Karnell, A., P. D. Cam, N. Verma and A. A. Lindberg. 1993. AroD deleteion attenuates Shigella flexneri strain 2457T and makes it a safe and efficacious oral vaccine in monkeys. Vaccine 8:830-836.) (Lindberg, A. A., A. Karnell, B. A. D. Stocker, S. Katakura, H. Sweiha and F. P. Reinholt. 1988. Development of an auxotrophic oral live Shigella flexneri vaccine. Vaccine 6:146-150) (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423) (Vaughan, L. M., P. R. Smith, and T. J. Foster. 1993. An aromatic-dependent mutant of the fish pathogen Aeromonas salmonicida is attenuated in fish and is effective as a live vaccine against the Salmonid disease furunculosis. Infect. Immun. 61:2172-2181), pur (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423) (Sigwart, D. F., B. A. D. Stocker, and J. D. Clements. 1989. Effect of a purA mutation on the efficacy of Salmonella live vaccine vectors. Infect. Immun. 57:1858-1861), and thy (Ahmed, Z. U., M. R. Sarker, and D. A. Sack. 1990. Protection of adult rabbits and monkeys from lethal shigellosis by oral immunization with a thymine-requiring and temperature-sensitive mutant of Shigella flexneri Y. Vaccine. 8:153-158) loci, which affect the biosynthesis of aromatic amino acids, purines, and thymine, respectively, are attenuating because they eliminate the ability of the bacterium to synthesize critical compounds that are not readily available within mammalian hosts. For example, aro mutants of Salmonella and Shigella species have been shown to be attenuated in their natural hosts (Hoiseth S. K. and B. A. D. Stocker. 1981. Aromatic-dependent Salmonella typhimurium are non-virulent and effective as live vaccines. Nature (london). 291: 238-239) (Homchampa, P., R. A. Strugnell and B. Adler. 1992. Molecular analysis of the aroA gene of Pasteurella multocida and vaccine potential of a constructed aroA mutant. Mol. Microbiol. 6: 3585-3593) (Homchampa, P., R. A. Strugnell and B. Adler. 1994. Construction and vaccine potential of an aroA mutant of Pasteurella

haemolytica. Vet. Microbiol. 42:35-44) (Karnell, A., P. D. Cam, N. Verma and A. A. Lindberg. 1993. AroD deletion attenuates Shigella flexneri strain 2457T and makes it it a safe and efficacious oral vaccine in monkeys. Vaccine 8:830-836) (Lindberg, A. A., A. Karnell, B. A. D. Stocker, S. Katakura, H. Sweiha and F. P. Reinholt. 1988. Development of an auxotrophic oral live Shigella flexneri vaccine. Vaccine 6:146-150) (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423). Lesions that affect the biosynthesis of LPS (Collins, L. V., S. Attridge, and J. Hackett. 1991. Mutations at rfc or pmi attenuate Salmonella typhimurium virulence for mice. Infect. Immun. 59:1079-1085) (Nnalue, N. A., and B. A. D. Stocker. 1987. Tests of the virulence and live-vaccine efficacy of auxotrophic and gale derivatives of Salmonella cholerasuis. Infect. Immun. 55:955-962) and of cyclic AMP (Kelly, S. M., B. A. Bosecker and R. Curtiss III. 1992. Characterization and protective properties of attenuated mutants of Salmonella cholerasuis. Infect. Immun. 60:4881-4890) (Tacket, C. I., D. M. Hone, R. Curtiss III, S. M. Kelly, G. Losonsky, L. Guers. A. M. Harris, R. Edelman. M. M. Levine. 1992. Comparison of the safety and immunogenicity of .DELTA.aroC .DELTA.aroD and .DELTA.cya.DELTA.crp Salmonella typhi strains in adult volunteers. Infect. Immun. 60:536-541) have also been shown to be attenuating in Salmonella species. It is important to note that not all attenuating mutations are good vaccine candidates in different organisms because some attenuating mutations result in poor persistence and immunogenicity (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423) (Sigwart, D. F., B. A. D. Stocker, and J. D. Clements. 1989. Effect of a purA mutation on the efficacy of Salmonella live vaccine vectors. Infect. Immun. 57:1858-1861).

Detailed Description Text (87):
A second method to produce live avirulent vaccines is to knock out genes in biosynthetic pathways known to be critical for survival in vivo. For example, the availability of compounds such as purines and aromatic amino acids is limited in mammalian hosts. Bacterial pathogens must be able to synthesize these compound themselves, or scavenge them from host tissues. Mutations in the biosynthetic pathways for purines and aromatic amino acids have been used to construct bacterial mutants that can not survive long in vivo, and thus have potential for use as attenuated vaccines. Much of the current research on genetically engineered live avirulent vaccines has been done with members of the genus Salmonella. These studies show that purA mutants are avirulent but poorly immunogenic (O'Callaghan et al, 1988), while mutations in the chorismate pathway, including aroA, aroC, and aroD, are attenuated and can be effective as live oral vaccines (Doggett & Curtiss, 1992; Tacket et al, 1992). In addition, Salmonella strains carrying cya and crp mutations, which produce mutants that lack the enzyme adenylate cyclase and the cyclic AMP receptor protein, which are required for the expression of numerous critical genes in bacteria, have been shown to be both avirulent and immunogenic (Doggett & Curtiss, 1992; Tacket et al, 1992; Kelly et al, 1992).

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CLAIMS:

1. A live vaccine against members of the family of Pasteurellaceae comprising a recombinant mutant of a member of the family of Pasteurellaceae lacking a rib gene necessary for the production of riboflavin in a pharmaceutically acceptable carrier.

4. A method of vaccinating a mammal in need thereof comprising administering to the mammal an effective vaccinating amount of a live vaccine comprising a recombinant mutant of a member of the family of Pasteurellaceae lacking a rib gene necessary for for the production of riboflavin in a pharmaceutically acceptable carrier.

5. A method of stimulating the immune system of a mammal in need thereof comprising the steps of:

(a) providing a recombinant Pasteurellaceae mutant having an inactivating mutation in one or more rib genes necessary for the production of riboflavin; and

(b) administering an effective immunogenic amount of the recombinant Pasteurellaceae mutant in a pharmaceutically acceptable carrier to a mammal in need thereof, thereby causing an antigenic response thereto, which stimulates the immune system in the mammal.

6. A method of inducing protective immunity in a mammal in need thereof against disease caused by Family Pasteurellaceae comprising the step of administering to the the mammal an effective amount of a recombinant Pasteurellaceae mutant having an inactivating mutation in one or more rib genes necessary for the production of riboflavin in a pharmaceutically acceptable carrier such that the mutant causes protective immunity in the mammal against Pasteurellaceae.

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TITLE: Vaccines of pasteurellaceae mutants and vaccination method

Abstract Text (1):
A live vaccine of recombinant mutants of a member of the family Pasteurellaceae lacking a rib gene necessary for production of riboflavin as well as a method of vaccination therewith is described. The vaccine is effective against members of the family Pasteurellaceae.

Brief Summary Text (6):
A variety of mutations in biosynthetic pathways are known to be attenuating in other organisms. Lesions in aro(Hoiseth S. K. and B. A. D. Stocker. 1981. Aromatic-dependent Salmonella typhimurium are non-virulent and effective as live vaccines. Nature (london). 291: 238-239) (Homchampa, P., R. A. Strugnell and B. Adler. 1992. Molecular analysis of the aroA gene of Pasteurella multocida and vaccine potential of a constructed aroA mutant. Mol. Microbiol. 6: 3585-3593) (Homchampa, P., R. A. Strugnell and B. Adler. 1994. Construction and vaccine potential of an aroA mutant of Pasteurella haemolytica. Vet. Microbiol. 42:35-44) (Karnell, A., P. D. Cam, N. Verma and A. A. Lindberg. 1993. AroD deleteion attenuates Shigella flexneri strain 2457T and makes it a safe and efficacious oral vaccine in monkeys. Vaccine 8:830-836.) (Lindberg, A. A., A. Karnell, B. A. D. Stocker, S. Katakura, H. Sweiha and F. P. Reinholt. 1988. Development of an auxotrophic oral live Shigella flexneri vaccine. Vaccine 6:146-150) (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423) (Vaughan, L. M., P. R. Smith, and T. J. Foster. 1993. An aromatic-dependent mutant of the fish pathogen Aeromonas salmonicida is attenuated in fish and is effective as a live vaccine against the Salmonid disease furunculosis. Infect. Immun. 61:2172-2181), pur (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423) (Sigwart, D. F., B. A. D. Stocker, and J. D. Clements. 1989. Effect of a purA mutation on the efficacy of Salmonella live vaccine vectors. Infect. Immun. 57:1858-1861), and thy (Ahmed, Z. U., M. R. Sarker, and D. A. Sack. 1990. Protection of adult rabbits and monkeys from lethal shigellosis by oral immunization with a thymine-requiring and temperature-sensitive mutant of Shigella flexneri Y. Vaccine. 8:153-158) loci, which affect the biosynthesis of aromatic amino acids, purines, and thymine, respectively, are attenuating because they eliminate the ability of the bacterium to synthesize critical compounds that are not readily available within mammalian hosts. For example, aro mutants of Salmonella and Shigella species have been shown to be attenuated in their natural hosts (Hoiseth S. K. and B. A. D. Stocker. 1981. Aromatic-dependent Salmonella typhimurium are non-virulent and effective as live vaccines. Nature (london). 291: 238-239) (Homchampa, P., R. A. Strugnell and B. Adler. 1992. Molecular analysis of the aroA gene of Pasteurella multocida and vaccine potential of a constructed aroA mutant. Mol. Microbiol. 6: 3585-3593) (Homchampa, P., R. A. Strugnell and B. Adler. 1994. Construction and vaccine potential of an aroA mutant of Pasteurella

haemolytica. Vet. Microbiol. 42:35-44) (Karnell, A., P. D. Cam, N. Verma and A. A. Lindberg. 1993. AroD deletion attenuates Shigella flexneri strain 2457T and makes it it a safe and efficacious oral vaccine in monkeys. Vaccine 8:830-836) (Lindberg, A. A., A. Karnell, B. A. D. Stocker, S. Katakura, H. Sweiha and F. P. Reinholt. 1988. Development of an auxotrophic oral live Shigella flexneri vaccine. Vaccine 6:146-150) (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423). Lesions that affect the biosynthesis of LPS (Collins, L. V., S. Attridge, and J. Hackett. 1991. Mutations at rfc or pmi attenuate Salmonella typhimurium virulence for mice. Infect. Immun. 59:1079-1085) (Nnalue, N. A., and B. A. D. Stocker. 1987. Tests of the virulence and live-vaccine efficacy of auxotrophic and gale derivatives of Salmonella cholerasuis. Infect. Immun. 55:955-962) and of cyclic AMP (Kelly, S. M., B. A. Bosecker and R. Curtiss III. 1992. Characterization and protective properties of attenuated mutants of Salmonella cholerasuis. Infect. Immun. 60:4881-4890) (Tacket, C. I., D. M. Hone, R. Curtiss III, S. M. Kelly, G. Losonsky, L. Guers. A. M. Harris, R. Edelman. M. M. Levine. 1992. Comparison of the safety and immunogenicity of .DELTA.aroC .DELTA.aroD and .DELTA.cya.DELTA.crp Salmonella typhi strains in adult volunteers. Infect. Immun. 60:536-541) have also been shown to be attenuating in Salmonella species. It is important to note that not all attenuating mutations are good vaccine candidates in different organisms because some attenuating mutations result in poor persistence and immunogenicity (O'Callaghan, D. D. Maskell, F. Y. Lieu, C. S. F. Easmon and G. Dougan. 1988. Characterization of aromatic and purine dependent Salmonella typhimurium: attenuation, persistence and ability to induce protective immunity in BALB/c mice. Infect. Immun. 56:419-423) (Sigwart, D. F., B. A. D. Stocker, and J. D. Clements. 1989. Effect of a purA mutation on the efficacy of Salmonella live vaccine vectors. Infect. Immun. 57:1858-1861).

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1: Vet Microbiol. 1994 Sep;42(1):35-44. Related Articles, Books, LinkOut

Construction and vaccine potential of an aroA mutant of Pasteurella haemolytica.

Homchampa P, Strugnell RA, Adler B.

Department of Microbiology, Monash University, Clayton, Melbourne, Vic., Australia.

The aroA gene, encoding 5-enolpyruvylshikimate 3-phosphate synthase, from Pasteurella haemolytica biotype A, serotype 1 was cloned by complementation of the aroA mutation in Escherichia coli strain AB2829 after electroporation with a DNA library constructed in pUC18. The cloned P. haemolytica aroA gene was inactivated by insertion of a kanamycin resistance gene and reintroduced by allelic exchange into the chromosome of the parental P. haemolytica using PbluescriptII SK+. The P. haemolytica aroA mutant was highly attenuated in a mouse septicaemic model. Mice immunized intraperitoneally with two doses of live P. haemolytica aroA mutant were protected against a lethal parental strain challenge.

PMID: 7839583 [PubMed - indexed for MEDLINE]

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(Homchampa, P., R. A. Strugnell and B. Adler. 1994. Construction and vaccine potential of an aroA mutant of Pasteurella haemolytica. Vet. Microbiol. 42:35-44) (Karnell, A., P. D. Cam, N. Verma and A. A. Lindberg. 1993.

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